



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/697,106

10/31/2003

Yann Bodo

117653

9004

25944

7590

12/01/2006

OLIFF & BERRIDGE, PLC

P.O. BOX 19928

ALEXANDRIA, VA 22320

EXAMINER

KRASNIC, BERNARD

ART UNIT

PAPER NUMBER

2621

DATE MAILED: 12/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/697,106

Applicant(s)

BODO ET AL.

Examiner

Bernard Krasnic

Art Unit

2621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 5-18-2004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_.

### **DETAILED ACTION**

1. It is noted that claims 13, 14 and 17 have been considered as independent claims in short hand form.

#### ***Drawings***

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: reference number "24".

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

Art Unit: 2621

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

4. The abstract of the disclosure is objected to because it is not narrative. It consists and has been drafted as one long run-on sentence, much like claim 1, which is improper. The intent of the abstract is to give a concise but brief statement of the disclosure or the invention as a whole consisting of a series of complete sentences forming a single paragraph.

Correction is required. See MPEP § 608.01(b).

5. The following title is suggested: -- A system and method of watermarking a video signal and extracting the watermarking from a video signal --.

6. The disclosure is objected to because of the following informalities:

Page 2, line 15: "OBJECTS AND SUMMARY OF THE INVENTION" should be -- SUMMARY OF THE INVENTION --.

Page 5, line 36: "MORE DETAILED DESCRIPTION" should be -- DETAILED DESCRIPTION --.

Appropriate correction is required.

***Claim Objections***

7. Claims 15 and 16 are objected to because of the following informalities:
- Claim 15, line 1: "A method according" should be -- The method according--.
- Claim 15, line 2: "applying a method" should be -- applying the method --.
- Claim 16, lines 1 and 3 respectively: "A method according" should be -- The method according--.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:
- The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
9. Claims 1-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re Claim 1: The conditional phrase "where necessary" in line 23 renders this claim indefinite because it is unclear whether it is necessary and therefore if the limitation is needed at all as an essential part of the claim or not.

Art Unit: 2621

Claims 3-6, 9, 11-14, and 16 are dependent upon claim 1.

Re Claims 2, 7, 8, and 15 respectively: The limitations "the reference partition" in claim 2, line 2, and in claim 15, line 8, "the reference grid" in claim 7, line 3, and in claim 8, lines 2-3, are insufficient antecedent basis. They are suggested to be -- the reference space portion -- respectively.

Claim 10 is dependent upon claim 8. Claims 16 and 17 are dependent upon claim 15.

Re Claim 15: The limitation "and consisting in" renders this claim indefinite because it is unclear which claimed subject matter is being consisting of. It is suggested to be -- and the extraction method consisting of --.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vynne et al (US 5,960,081) in view of Han et al (US 6,845,130 B1).

Vynne, as recited in claim 1, discloses a method of watermarking / embedding a digital signature (217) (see Fig. 2.2, Abstract, lines 1-2) a video signal by applying a watermarking function to motion vectors calculated by estimation of movement (see col. 8, lines 1-9) between images of the video signal, the method comprising the following steps of applying the watermarking function to at least some of the calculated motion vectors (see Abstract, lines 4-6, col. 8, lines 1-3); and generating the watermarked video signal by compensating movement with the aid of the watermarked motion vectors (see Abstract, lines 1-6, col. 8, lines 1-3), the watermarking function being applied with the aid of a binary marking key (217, 219) (see Fig. 2.2, Abstract, lines 13-16, col. 7, lines 51-64, col. 12, lines 1-12), each bit of which is associated with at least one selected motion vector (Abstract, lines 13-16, col. 7, lines 51-64), to apply the watermarking function, the method further comprises the following steps of marking the coordinates of the selected motion vector (V) in a reference space divided into a plurality of predetermined portions (see Fig. 3.1A, 3.2, col. 7, lines 43-51); defining two complementary zones Z0 and Z1 in each portion, one of the two zones being situated inside the other one; assigning a binary value to each of the two zones; and where necessary, modifying the coordinates of the selected motion vector (see col. 7, lines 48-51, col. 8, lines 1-3) so that it is in the zone of the portion to which it belongs, of binary

value which corresponds to the bit of the marking key with which the selected motion vector is associated (see col. 7, lines 48-51).

Vynne, as recited in claim 11, discloses each bit of the binary marking key is associated with a plurality of selected motion vectors (see Fig. 2.2, Abstract, lines 13-15, col. 7, lines 41-59, col. 11, lines 50-67, col. 12, lines 1-12).

Vynne, as recited in claim 12, disclose some of the bits of the binary marking key are associated with motion vectors calculated by motion estimation between two images of the video signal (see col. 7, lines 43-51), and wherein at least one other portion of the bits of the binary marking key is associated with motion vectors calculated by motion estimation between at least two other images of the video signal (col. 14, lines 60-63). Although Vynne fails to specifically disclose the limitation of using at least two other images for part of the binary marking key, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have such a feature because of the fact that it increases the difficulty of removing the embedded digital signature even further.

Vynne, as recited in claim 13, discloses a device (210, 700, 710) for watermarking a video signal, the device (see Fig. 2.2, 7.1, col. 2, lines 12-22, see col. 10, lines 11-12) including means for implementing a method according to claim 1.

The limitation, as recited in claim 13, line 2, "means for implementing", invokes 35 USC 112, 6<sup>th</sup> paragraph.



Vynne, as recited in claim 14, discloses a computer readable data medium (700, 710), including means for storing a video signal watermarked with the aid of a method according to claim 1 (see Fig. 7.1, col. 10, lines 11-12).

The limitation, as recited in claim 14, lines 1-2, "means for storing", invokes 35 USC 112, 6<sup>th</sup> paragraph.

Vynne, as recited in claim 15, discloses a method of extracting watermarking (240) (see Fig. 2.3) from a video signal watermarked by applying a method according to claim 1, which extraction method comprises applying a function for extracting the binary marking key (228, 229) (see Fig. 2.3), and consisting in: selecting the watermarked vectors (see col. 8, lines 10-13, Abstract, lines 13-16, col. 7, lines 51-64); marking the coordinates of each watermarked motion vector in the reference partition (see col. 8, lines 10-13, Fig. 3.1A, 3.2, col. 7, lines 43-51); and assigning the binary value of the zone in which the watermarked vector is situated to the bit of the marking key with which the selected motion vector is associated (see col. 8, lines 10-13, Fig. 2.2, Abstract, lines 13-16, col. 7, lines 51-64, col. 12, lines 1-12). This claim is similar to claim 1 with the exception it is respectively opposite in that it is getting the embedded signature instead of actually embedding the signature (see Fig. 2.3, col. 8, lines 10-13).

Vynne, as recited in claim 17, discloses a device (700, 710) for extracting the watermarking from a video signal, including means (see Fig. 7.1, 10A, 10B, col. 8, lines 10-13, col. 10, lines 11-12) for implementing a method according to claim 15.

The limitation, as recited in claim 17, line 2, "means for implementing", invokes 35 USC 112, 6<sup>th</sup> paragraph.

However Vynne fails to disclose or fairly suggest defining two complementary zones Z0 and Z1 in each portion, calculating a hierarchical plurality of successive levels of motion vectors, the motion vectors of a given level are each equal to the average of the motion vectors of the next lower level with which they are associated, calculating a hierarchy of two successive levels of motion vectors, calculating an average vector equal to the average of the watermarked motion vectors associated with said motion vector, and applying the marking key extraction function to the calculated average vector.

Han, as recited in claim 1, discloses defining two complementary zones Z0 and Z1 in each portion (see Fig. 1, the two zones being within 16 and between 16 and 18), one of the two zones being situated inside the other one (see Fig. 1, 16 is situated inside 18) and assigning a binary value (taught by Vynne above) to each of the two zones.

Han, as recited in claim 2, discloses the reference partition is a reference grid (18) including blocks with predefined dimensions (see col. 1, lines 40-41), each block including first and second zones (see Fig. 1, the two zones being within 16 and between 16 and 18).

Han, as recited in claim 3, discloses calculating a hierarchical plurality of successive levels (Level 0, Level 1, Level 2) of motion vectors (see Fig. 5, 6, col. 3, lines 45-47), the motion vectors of a given level each being associated with a plurality of motion vectors of the next lower level (see col. 3, lines 20-23); selecting at least some of

Art Unit: 2621

the motion vectors belonging to the highest level (taught by Vynne above in claim 1); applying the watermarking function to each selected motion vector, leading to calculating a modification parameter for said motion vector (taught by Vynne above in claim 1); and applying the modification parameter of the selected motion vector to the motion vectors of a lower level (it would have been obvious to one of ordinary skill in the art at the time the invention was made to have such a feature because of the fact that applying the modification to the lower levels would increase the difficulty of removing the embedded digital signature even further) associated with said motion vector.

Han, as recited in claim 4, discloses the motion vectors of a given level are each equal to the average of the motion vectors of the next lower level (see Fig. 6, col. 3, lines 20-23) with which they are associated.

Han, as recited in claim 5, discloses calculating a hierarchy of two successive levels of motion vectors, each motion vector of the higher level being associated with four motion vectors of the lower level (see Fig. 6, col. 3, lines 20-23).

Han, as recited in claim 6, discloses the first and second zones have substantially equal areas (see Fig. 1, the two zones being within 16 and between 16 and 18, substantially equal areas as long as 18 is adjusted the needed amount which it is capable of doing, col. 1, lines 40-41).

Han, as recited in claim 7, discloses a sub-block centered inside the block is defined in each block of the reference grid (18), the first zone being defined by the interior of the sub-block and the second zone being the zone in the block

Art Unit: 2621

complementary to the first zone (see Fig. 1, the two zones being within 16 and between 16 and 18).

Han, as recited in claim 8, discloses the blocks and sub-blocks of the reference grid (16, 18) are rectangular (it would have been obvious to one of ordinary skill in the art at the time the invention was made to have such a feature because a rectangle is respectively a square as is seen in Fig. 1).

Han, as recited in claim 16, discloses extracting the watermarked motion vectors associated with said motion vector (taught by Vynne above in claim 15); calculating an average vector equal to the average (see Fig. 6, col. 3, lines 20-23, respectively the same as in claim 4 with the exception that the average is taken after the signature has been applied and removed) of the watermarked motion vectors associated with said motion vector; and applying the marking key extraction function to the calculated average vector (it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the marking key extraction function to the average vector instead of the vector taught by Vynne because of the fact that creating these average vectors would increase the difficulty of removing the embedded digital signature even further).

Therefore, in view of Han, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Vynne's method by including the two complementary zones with hierarchical successive levels of motion vectors in order to enhance the difficulty of removing the embedded digital signature and create a further visual imperceptibility.

Re Claims 9-10 respectively: Although Vynne and Han fail to specifically disclose the limitation of having a modification, if any, applied to the selected motion, vector (V) is a weighted symmetry, weighted central symmetry, or a weighted axial symmetry relative to one of the sides of the sub-block, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have such a feature because of the fact that applying the modification as taught by Vynne (see col. 7, lines 48-51, col. 8, lines 1-3) in this type of weighted symmetric manner is much simpler and it gives the ability to increase the difficulty of removing the embedded digital signature even further.

### ***Conclusion***

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Akhan et al discloses a method and system for a highly efficient low bit video codec; Kutter et al discloses a method for marking a compressed digital video signal; Suda discloses an image processing apparatus, image processing method and computer readable memory medium; Hogan discloses a device and method for correcting video stream without re-calculating motion vector.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard Krasnic whose telephone number is (571) 270-1357. The examiner can normally be reached on Mon-Thur 7:30am-5:00pm and every other Friday 7:30am-4:00pm.

Art Unit: 2621

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jong-Suk (James) Lee can be reached on (571) 272-7044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Bernard Krasnic  
November 21, 2006



JONG SUK LEE  
SUPERVISORY PATENT EXAMINER